



USER-SUPPORTED REGIONAL TRUCKWAYS IN SOUTHERN CALIFORNIA

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USER-SUPPORTED REGIONAL TRUCKWAYS IN SOUTHERN CALIFORNIA

1. Introduction

The development of a regional system of user supported, dedicated truckways offers a viable and self-financing way to mitigate congestion and reduce vehicle emissions in Southern California. This Briefing Paper details the broad physical and financial parameters of a proposed regional truckways system comprising 142 center-lane miles of dedicated truck lanes extending from the San Pedro Bay ports eastward to Barstow. At a capital development cost of approximately \$16.5 billion, it can be shown that a per-mile toll ranging from \$0.38 to \$0.80, and averaging \$0.56 over a thirty-year financing period, would be sufficient to totally fund the development and operation of this system. Applicable to existing and forecast volumes of truck traffic within this nationally significant trade corridor, it is envisioned here that this toll would be imposed and administered by a regionally controlled Corridor Authority. This authority would be instituted as a joint-powers authority in a fashion analogous to that of the Transportation Corridor Authorities established in Orange County, and would similarly adhere to existing Caltrans and labor relations contracting protocols.

The Southern California region is facing a crisis in goods movement transportation, characterized by a dramatic growth in rail and truck traffic that is running head-long into limited transportation funding and high infrastructure improvement costs. Forecasts of greater regional population and employment, and projections of increasing international and domestic trade volumes, all lead inevitably to worsening congestion and the potential of gridlock occurring within the region's surface transportation system—a situation that would surely have a detrimental impact on the region's, as well as the nation's, economic well-being.

The surface transportation system is already strained by the number of trucks and trains operating in and through the region. Worst

among eight of the nation's most congested urban areas, Los Angeles metropolitan commuters now endure 136 annual delay-hours per commuter, and SCAG forecasts that average delay will increase in the region.

The development of a regional system of user supported, dedicated truckways offers a viable and potentially self-financing solution for mitigating congestion and reducing mobile source emissions arising from surface transportation operations in Southern California, while also ensuring the safe, reliable, and efficient movement of goods essential to the nation's economy. The general motoring public would benefit significantly in terms of congestion relief, and enjoy greater operational safety and system reliability. Together with improved regional air quality, these environmental and safety advantages warrant a significant level of public involvement in the realization of a regional truckways system.

Depending on various regulatory and operating assumptions, estimates indicate that revenues generated by tolls collected from users of these facilities would be sufficient to both finance the total capital costs of development and cover the operations and maintenance costs of the system.

This brief presents an example of how a regional system of dedicated truckways might be configured in the region, providing a preliminary estimate of likely capital development costs, facility dimensions, and an estimate of potential user-supported revenues.

2. Conceptual Engineering of Truckways

In a final report released in February 2001, SCAG examined the feasibility of a dedicated truckways facility running east-west along State Route 60. This report considered conceptual physical design and operational characteristics a regional truckways system would require, and in addition explored user-supported financing options. Envisioning a facility with two dedicated truck lanes operating in each direction, this report concluded that the development of such a facility would be feasible, and that the benefits

a truckways system would contribute to the region's surface transportation system as a whole were sufficient enough to warrant the participation of public funding in the creation of these lanes.

Additional major investment studies of key regional goods movement corridors are presently underway for the I-710 and I-15, and a study of the Eastern Gateway Freeway Corridor, representing an expanded conception of the SR-60 truck lanes, will commence later this year. Also, the Reason Foundation recently released a study of inter-city toll truckways, which concludes that tolled truckways would be financially self-sufficient across a wide range of possible development scenarios.

Combining insights gained and now emerging from this set of studies, an outline of a regional truckways system can be discerned

revenue contribution would be necessary to finance development of the system.

3. Capital Costs And Revenue Requirements

Using information developed through the various corridor studies that have been undertaken, it is possible to demonstrate the level of user-contributed revenue necessary to finance development of a regional truckways system. The SR60 Feasibility Study established an ability to fund 30% of development costs through a voluntary tolling of truck trips. Using a graduated toll rate topping out at 70 cents for the largest vehicles and 35 cents for lighter trucks, this study evaluated facility configurations, right-of-way requirements, present and forecast truck volumes, and market pricing mechanisms to determine the overall feasibility of a dedicated



sufficiently to allow for a preliminary exercise to ascertain what level of user-supported

truckway in an urban context. Looking at dedicated truckways in a rural, inter-city context, the Reason Foundation has

demonstrated that truckway facilities are capable of generating positive returns on investment under a broad range of differing assumptions, and even at market-rate levels of return. Of particular significance in this instance are the operational benefits that could be realized with a nation-wide authorization for the use of longer combination vehicles (LCVs). By permitting up to double the payload carrying capacity of presently authorized truck sizes and weights in California, the operation of LCVs along dedicated truck facilities offers the potential of fewer total trips and less regional vehicle miles traveled (VMT), a corresponding reduction in vehicle emissions, and, more importantly for private equipment operators, greater capital utilization margins. These operating benefits, realized as a reduction in operating costs, were estimated by the Reason Foundation of having a value of up to \$40 billion a year at the national level. The capacity utilization benefits accruing with the use of LCVs can commence on trips as short as 14 miles in length, and are soundly beneficial for trips greater than 25 miles. Taking these operating benefits into account, the Reason Foundation estimated rather conservatively that per mile toll rates structure to capture just 50% of these greater operating margins would support a toll rate of up to 80 cents per-mile.

In an urban context, better equipment utilization factors would be realized as well through the greater operating speeds and system reliability possible along free-flowing truckways, resulting in utilization factors once again several multiples greater than those currently attainable.

lane-mile basis, it can be shown—assuming an averaged urban area per-mile development cost of \$27.5 million, a design capacity of 800 vehicles per-mile per-hour, an interest rate of 5%, and an 80 cents per-mile toll—that revenues generated by the facility could potentially exceed capitalization costs by a ratio of greater than 2:1:

Per Lane-mile Analysis

Annual Debt Service:	\$1.7 million
Capacity Revenue:	\$3.8 million
Coverage Ratio:	2.24

This calculation suggests that user-supported truckways could conceivably be built where ever sufficient truck traffic exists.

B. Truck Vehicle Miles Traveled (VMT)

Alternatively looking at a revenue estimate based VMT, it can be demonstrated that, given an average corridor trip length of 37 miles and the average annual daily truck trips (AADTT) of 143,500 presently occurring along the Eastern Gateway Freeway Corridor, an average per-mile toll of 56 cents would fully cover the estimated \$16.5 billion capital development, and operations and maintenance costs of a regional truckways system. (See Section 4 following).

This estimate shows that there is adequate demand in the corridor to support the truckways system at a reasonable per-mile toll.

SCAG Region Dedicated Truckways System					
Route	Length (miles)	Lane miles	Total Cost (000)	Per Mile Cost (000)	Lane Mile Cost (000)
Truck Lanes					
I-710	18.0	86.0	\$2,166,200	\$120,344	\$25,188
SR-60	37.8	151.2	\$4,300,000	\$113,757	\$28,439
I-15	86.0	344.0	\$10,066,386	\$117,051	\$29,263
Totals	141.8	581.2	\$16,532,586		

A. Conceptual One-mile

Considering the revenue coverage ratio possibilities of dedicated truckways on a per-

C. System Carrying Capacity

Conceptual truckway designs thus far developed envision primarily a two-lane facility

operating in each direction. In such a configuration, the total per-mile, per-hour carrying capacity of the system would be 3,200 vehicles, indicating a total daily system capacity of 10,905,600 truck-miles. With an AADTT of 143,500 and an average trip length of 37 miles, present daily truck-mile demand can be estimated at 5,309,500; suggesting a system utilization ratio of 0.49, and therefore sufficient capacity at the overall design level.

At each of these levels of analysis, the concept of a user-supported and self-financing regional system of dedicated truckways appears credible, and even advantageous. Further investigations will help to clear some present caveats that should be noted concerning estimated facility costs, vehicle counts, and system configuration. Certainly more advanced design of the truckways system as it would apply to particular highway segments could find value engineering opportunities capable of lowering the averaged system-wide cost figures used in this brief. Further detail on vehicle counts and movements throughout the system should similarly help to define segments of the system where a right-sizing exercise would realize cost savings and operating efficiencies.

Furthermore, as the various analytical approaches shown here suggest, other possible configurations of a regional truckways system, such as one designed specifically to handle longer combination vehicles (LCVs, such as Turnpike Doubles) that would be built-up or broken-down at termini situated at the ports in the west and at perhaps Ontario and Barstow in the east, would also be potentially viable and worthy of further evaluation.

And finally, as the administration's recent proposal to fund \$1.2 billion in fuel cell vehicles and hydrogen fuel research portends, technological advances in engine design and alternative fuels will likely emerge as the regional truckways system is being developed. The truckways concept would facilitate the introduction and proliferation of these technologies by providing for distribution and service facilities related to the operations along dedicated right-of-ways.

4. Regional Toll Truckway Preliminary Financial Analysis

A preliminary assessment of the financial viability of a dedicated toll truckway facility in the Southern California region indicates that based on certain assumptions, a toll truckway facility would be capable of covering operating and maintenance costs in addition to capital development costs by the year 2039. This preliminary assessment relies on the following key assumptions:

- To raise construction funds, net revenues generated from the tolls are leveraged to issue tax-exempt revenue bonds. Net revenues also include interest earnings less operations and maintenance related expenses.
- The regional toll truckway system would be 100 percent leveraged through debt. Capital financing instruments could potentially include a combination of senior-lien tax-exempt bond and federal credit enhancement in the form of a loan (at 33% of total eligible capital cost –TIFIA). The flexible repayment schedule and the subordinate lien would enhance the coverage ratio on the senior bonds.
- Total construction costs are estimated to be \$16.5 billion in today's dollars. Capital cost assumptions are based upon gross cost estimates produced in a set of previous studies.
- The facility is assumed to operate with electronic toll collection technology estimated to cost about \$14.8 million annually. Additional operation and maintenance costs associated with the roadway are assumed to be \$4.3 million annually.
- Tolls are assumed to be imposed at an average rate of \$0.56 per mile.
- The analysis involving tax-exempt revenue bonds include capitalized interest to cover the years between debt issuance and the commencement of toll revenue collection

– issuance assumed in 2005 and toll revenue collection beginning in 2010.

- The regional toll truckway project would require significant long-term borrowing. As a result, the analysis assumes debt retirement in 2039.
- A 5 percent interest rate is assumed for the tax-exempt revenue bond and the TIFIA loan.
- The debt-service coverage ratios, comprising net revenues (after deducting operating and maintenance expenses) over projected debt service requirements, are assumed to meet a 1.68x coverage factor for the senior lien and a 1.04x coverage factor for the TIFIA loan.

REGIONAL TOLL TRUCKWAY

Tax Exempt Bond Financing

Assumptions	
Par Amount (Senior Tax Exempt)	\$12,100,000,000
TIFIA Loan	\$6,800,000,000
Interest Rate	5.00%
Traffic Growth Rate per Year	2.60%
Average Annual Daily Truck Trips (AADTT)	143,500
Average Trip Length (Miles)	37
Annual Operations and Maintenance Costs	\$4,359,000
Annual Electronic Tolling Costs	\$14,760,736
Debt Issuance/Construction Start Year	FY 2005
Construction Draws	FY 2005 - FY 2009
Capitalized Interest Period	FY 2005 - FY 2009
Interest Earning Rate	5.00%
Commencement of Toll Operation	FY 2010
Average Toll Rate/Mile	\$0.56

Sources	
Senior Bond Proceeds	\$12,100,000,000
TIFIA Loan Proceeds	\$6,800,000,000
Interest Earnings	\$1,620,721,210
TOTAL SOURCES	\$20,520,721,210

Uses	
Capital Dev. Costs (Cons. w/ Contingencies, Eng.,RoW)*	\$16,532,586,000
Capitalized Interest During Construction	\$3,025,000,000
Cost of Issuance	\$180,183,029
Debt Service Reserve Fund	\$782,952,181
TOTAL SOURCES	\$20,520,721,210

*Capital cost assumptions are based upon gross cost estimates produced in a set of previous studies.
Numbers may not add due to rounding.

REGIONAL TOLL TRUCKWAY
Tax Exempt Bond Financing

Fiscal Year	Truck VMT Subject to Tolls	Toll Rate/ Mile	Net Revenues (Less O&M)	Senior Debt Service	Debt Service Reserve Fund	Annual Net Debt Service	Senior Debt Coverage Ratio	TIFIA Debt Service	TIFIA Coverage Ratio
2005				\$ 302,500,000	\$ (19,573,805)				
				\$ 302,500,000	\$ (19,573,805)	\$ 565,852,391			
2006				\$ 302,500,000	\$ (19,573,805)				
				\$ 302,500,000	\$ (19,573,805)	\$ 565,852,391			
2007				\$ 302,500,000	\$ (19,573,805)				
				\$ 302,500,000	\$ (19,573,805)	\$ 565,852,391			
2008				\$ 302,500,000	\$ (19,573,805)				
				\$ 302,500,000	\$ (19,573,805)	\$ 565,852,391			
2009				\$ 302,500,000	\$ (19,573,805)				
				\$ 302,500,000	\$ (19,573,805)	\$ 565,852,391			
2010	1,588,638,778	\$ 0.80	\$ 1,249,591,681	\$ 391,476,090	\$ (19,573,805)	\$ 743,804,572	1.68	\$ 487,096,646	1.04
2011	1,629,943,386	\$ 0.78	\$ 1,249,591,681	\$ 391,476,090	\$ (19,573,805)	\$ 743,804,572	1.68	\$ 487,096,646	1.04
2012	1,672,321,914	\$ 0.76	\$ 1,249,591,681	\$ 391,476,090	\$ (19,573,805)	\$ 743,804,572	1.68	\$ 487,096,646	1.04
2013	1,715,802,284	\$ 0.74	\$ 1,249,591,681	\$ 391,476,090	\$ (19,573,805)	\$ 743,804,572	1.68	\$ 487,096,646	1.04
2014	1,760,413,143	\$ 0.72	\$ 1,249,591,681	\$ 391,476,090	\$ (19,573,805)	\$ 743,804,572	1.68	\$ 487,096,646	1.04
2015	1,806,183,885	\$ 0.70	\$ 1,249,591,681	\$ 391,476,090	\$ (19,573,805)	\$ 743,804,572	1.68	\$ 487,096,646	1.04
2016	1,853,144,666	\$ 0.68	\$ 1,249,591,681	\$ 391,476,090	\$ (19,573,805)	\$ 743,804,572	1.68	\$ 487,096,646	1.04
2017	1,901,326,427	\$ 0.67	\$ 1,249,591,681	\$ 391,476,090	\$ (19,573,805)	\$ 743,804,572	1.68	\$ 487,096,646	1.04
2018	1,950,760,915	\$ 0.65	\$ 1,249,591,681	\$ 391,476,090	\$ (19,573,805)	\$ 743,804,572	1.68	\$ 487,096,646	1.04
2019	2,001,480,698	\$ 0.63	\$ 1,249,591,681	\$ 391,476,090	\$ (19,573,805)	\$ 743,804,572	1.68	\$ 487,096,646	1.04
2020	2,053,519,197	\$ 0.62	\$ 1,249,591,681	\$ 391,476,090	\$ (19,573,805)	\$ 743,804,572	1.68	\$ 487,096,646	1.04
2021	2,106,910,696	\$ 0.60	\$ 1,249,591,681	\$ 391,476,090	\$ (19,573,805)	\$ 743,804,572	1.68	\$ 487,096,646	1.04
2022	2,161,690,374	\$ 0.59	\$ 1,249,591,681	\$ 391,476,090	\$ (19,573,805)	\$ 743,804,572	1.68	\$ 487,096,646	1.04
2023	2,217,894,323	\$ 0.57	\$ 1,249,591,681	\$ 391,476,090	\$ (19,573,805)	\$ 743,804,572	1.68	\$ 487,096,646	1.04
2024	2,275,559,576	\$ 0.56	\$ 1,249,591,681	\$ 391,476,090	\$ (19,573,805)	\$ 743,804,572	1.68	\$ 487,096,646	1.04
2025	2,334,724,125	\$ 0.54	\$ 1,249,591,681	\$ 391,476,090	\$ (19,573,805)	\$ 743,804,572	1.68	\$ 487,096,646	1.04
2026	2,395,426,952	\$ 0.53	\$ 1,249,591,681	\$ 391,476,090	\$ (19,573,805)	\$ 743,804,572	1.68	\$ 487,096,646	1.04
2027	2,457,708,053	\$ 0.52	\$ 1,249,591,681	\$ 391,476,090	\$ (19,573,805)	\$ 743,804,572	1.68	\$ 487,096,646	1.04
2028	2,521,608,462	\$ 0.50	\$ 1,249,591,681	\$ 391,476,090	\$ (19,573,805)	\$ 743,804,572	1.68	\$ 487,096,646	1.04
2029	2,587,170,282	\$ 0.49	\$ 1,249,591,681	\$ 391,476,090	\$ (19,573,805)	\$ 743,804,572	1.68	\$ 487,096,646	1.04
2030	2,654,436,710	\$ 0.48	\$ 1,249,591,681	\$ 391,476,090	\$ (19,573,805)	\$ 743,804,572	1.68	\$ 487,096,646	1.04
2031	2,723,452,064	\$ 0.47	\$ 1,249,591,681	\$ 391,476,090	\$ (19,573,805)	\$ 743,804,572	1.68	\$ 487,096,646	1.04
2032	2,794,261,818	\$ 0.45	\$ 1,249,591,681	\$ 391,476,090	\$ (19,573,805)	\$ 743,804,572	1.68	\$ 487,096,646	1.04
2033	2,866,912,625	\$ 0.44	\$ 1,249,591,681	\$ 391,476,090	\$ (19,573,805)	\$ 743,804,572	1.68	\$ 487,096,646	1.04
2034	2,941,452,353	\$ 0.43	\$ 1,249,591,681	\$ 391,476,090	\$ (19,573,805)	\$ 743,804,572	1.68	\$ 487,096,646	1.04
2035	3,017,930,114	\$ 0.42	\$ 1,249,591,681	\$ 391,476,090	\$ (19,573,805)	\$ 743,804,572	1.68	\$ 487,096,646	1.04
2036	3,096,396,297	\$ 0.41	\$ 1,249,591,681	\$ 391,476,090	\$ (19,573,805)	\$ 743,804,572	1.68	\$ 487,096,646	1.04
2037	3,176,902,601	\$ 0.40	\$ 1,249,591,681	\$ 391,476,090	\$ (19,573,805)	\$ 743,804,572	1.68	\$ 487,096,646	1.04
2038	3,259,502,069	\$ 0.39	\$ 1,249,591,681	\$ 391,476,090	\$ (215,311,850)	\$ 357,221,932	3.50	\$ 487,096,646	1.83
2039	3,344,249,122	\$ 0.38	\$ 1,249,591,681	\$ 391,476,090	\$ (210,418,399)	\$ 376,795,737	3.32	\$ 487,096,646	1.79
		Average Fee/Mile \$ 0.56		\$ 26,513,565,423	\$ (2,123,757,790)	\$ 24,389,807,633		\$ 14,612,899,378	